MEDICAL JURISPRUDENCE AND TOXICOLOGY.

UNDER THE CHARGE OF

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Prophylaxis of Hydrophobia.

Pasteur has recently (November, 1886) communicated to the *Académie des Sciences* the results of the employment of his much heard of method during the one year which has elapsed since he gave his first communication to the Académie on October 26, 1885. 2490 persons, supposed to have been bitten by mad dogs, were treated by his method during that period. The treatment of each was uniform, lasting always for ten days, during which a daily injection of infusion of spinal cord of a rabbit was made, beginning with a cord of fourteen days' exposure, and ending with one of five days. He classifies the patients according to their nationality. It is interesting to note that while, as was to be expected, the majority (about two-thirds) were French, 80 were English, 21 American, and many came from the remotest parts of Europe. Out of the 1726 French and Algerian cases, 10 were unsuccessful, the patients afterward dying of hydrophobia. This is equal to a mortality of 1 in 172. During the five years preceding November, 1885, the number of deaths from hydrophobia in the hospitals of Paris was, on an average, 12 a year. During the year ending November, 1886, there have been only 3 deaths, and in 2 of these the patient had not previously been treated by Pasteur's method. Pasteur believes that these results are strongly confirmatory of the utility of his method.

He has found it necessary to modify his method in the case of patients bitten on the face or head, or bitten very severely elsewhere, especially if the parts were naked. This he does by passing more rapidly than usual, and with omissions, through the injection of the graded cords, until a spinal cord of one day old is used.

Finally, in order to meet the objection which has been raised to the experiments on dogs, on which his method is based, that the dogs were inoculated *before* being bitten, whereas men are inoculated *after* they are bitten, Pasteur has made some fresh experiments on dogs in which he practised intracranial injection with fresh unmitigated virus, and then inoculated the animals some time afterward in the usual way. These experiments were evidently not very successful, hydrophobia appearing in most of them. Pasteur concludes with the remark that the immunity conferred by inoculation previous to infection offers the best proof of the excellence of the method.

Pharmacological and Toxicological Study of Digitalin.

Lafon (*Annal. d'hygiène Publique*, sér. 3, tom. xvi. pp. 429–444, and 506–519) begins with a comparison of the physical and chemical characters of the different commercial varieties of digitalin. These are chiefly the crystallized digitalin of Nativelle, the amorphous digitalin of Homolle and Duquesnel, and the crystallized and amorphous digitalins of Germany (Merck). The German varieties are fairly soluble in water, while the others are very slightly soluble. In chloroform the latter are more soluble than the former, which are insoluble. Further, the latter do not yield the author's reaction (*vide* this journal, 1886, p. 345) with sulphuric acid and perchloride of iron, while the former do. Further comparison leads to the conclusion that all the French varieties of crystallized digitalin are identical in their physical and chemical properties; that the amorphous digitalin of Homolle and Quèvenne is nearly identical with the digitoxin of the Germans, and resembles the French digitalins in its chemical properties, though considerably differing from them in its fusion point; and that the German digitalin differs from the French digitalin in many of its chemical properties.

In the next place, the author proceeds to prescribe a method of separating the digitalin in a case of poisoning by it. He says Stas's, Otto's, and Dragendorff's methods readily allow of the separation of the digitalin, but not in a very pure form. And as the purity of the separated digitalin is of great importance in the application of the author's color reaction, he describes a modified process by which the digitalin can be obtained in a purer form than is usual. The material supposed to contain the digitalin is to be thoroughly extracted with hot alcohol, then filtered; and the filtrate evaporated until nearly all the alcohol is driven off. An abundant precipitate forms in the aqueous residue, which is separated by filtration through glass wool. Subacetate of lead is now added to the filtrate, which is again filtered. The filtrate is next treated with sulphuric acid to remove the excess of lead, and is once more filtered. The filtrate is now shaken with chloroform, which removes the digitalin in a very pure form, and which, after the evaporation of the chloroform, can be employed for the author's reaction. By such a proceeding the author has been able to detect 1 mgrm. (0.015 grain) in 200 c. cm. of urine, and 3 to 4 mgrms. in vomits, soups, blood, etc.

The next portion of the author's communication is devoted to experiments on the action of digitalin on dogs, given *per os*, subcutaneously, and intravenously. Homolle and Quèvenne's digitalin appears to have been used in all these experiments (which are twenty-five in number) except in one or two, in which digitalis powder was employed. The experiments were mainly directed toward ascertaining to what extent the digitalin could be afterward detected in the body. His conclusions in this respect are (1) where small poisonous doses have been given *per os*, no trace of digitalin is discoverable in the urine, blood, liver, kidneys, lungs, brain, etc. But if the dose is over 10 centigrammes (1½ grains), and vomiting has not occurred, the poison can be detected within the body: (2) the digitalin is most easily found in the contents of the stomach or intestines (or in the vomit); (3) after poisoning *per os* by small doses, digitalin cannot be detected in the internal organs of an animal which has been buried for some time (six to seven months) (4) after poisoning by subcutaneous injection, the digitalin is not to be found anywhere unless in the muscles in the vicinity of the seat of injection; (5) after poisoning by intravenous injection, the digitalin cannot be detected unless the animal dies, or is killed, within ten to twenty minutes after the injection.

With regard to the relative toxicity of the various kinds of digitalin when administered subcutaneously, the author finds that (1) the various crystalline digitalins (Nativelle's, Duquesnel's, Homolle and Quèvenne's, Mialhe's) have nearly the same activity—about two milligrammes per kilogramme of body weight being sufficient to kill a dog; (2) the so-called "digitalin chloroformique" (Codex) of Homolle and Quèvenne possesses the same toxicity as the foregoing; (3) that the German digitoxin, although considered more active than these others, is not so, and possesses about the same activity.

As to the elimination of digitalin from the organism, the results of the author's experiments appear to point to its more or less complete destruction within the body. It is only found in the urine when very large doses have been administered, even though injected intravenously. In the case of two patients who were receiving 40 centigrammes (6 grains) daily of digitalis leaves in the form of an infusion, no digitalin could be detected in the urine. But if 40 centigrammes of digitalis were digested with urine, the digitalin could afterward be readily separated and recognized.

With reference to the supposed accumulation of digitalin within the body after repeated doses of it, the author was not able to find any confirmation of this supposition.

The author finally investigated the resistance of digitalin to the action of diastase, pepsine, pancreatic juice, bile, mineral acids, caustic alkalies, yeast ferment, and emulsine, as also to the action of putrefaction, and found that the digitalin was little affected. He therefore infers that it is not decomposed in the alimentary canal, but is probably much transformed in the blood.

ACCIDENTAL POISONING FROM THE USE OF SUBNITRATE OF BISMUTH IN SURGICAL DRESSINGS.

DALCHÉ, of the Hotel Dieu, reports two such cases in the *Annales d'hygiène Publique* (sér. 3, tom. xvi. pp. 358–361). The first is that of a woman who was admitted to the hospital with a very extensive burn over the back and left arm. It was dressed with subnitrate of bismuth, the dressing being renewed every two days. About a fortnight after the commencement of the treatment the patient began to complain of slight pain in the throat, accompanied by dysphagia. On the under surface of the soft palate a white false membrane was observed, which extended to the tonsils. In two days the membrane became more extended, and was covered with a blackish mucus. A small patch of membrane was also noticed on the lower lip. The breath became fetid, and the false membranes gradually became detached and loose, but with the formation of new membranes in other parts of the throat and mouth. A few days later diarrhœa, and afterward vomiting, set in. The bismuth dressing was now stopped. The preparation used was found to be absolutely pure, and the presence of bismuth was detected in the feces and the urine. Albumen was also found in the urine. The vomiting and diarrhœa continued for two or three days after the stoppage of the bismuth. But the other symptoms of bismuth poisoning did not entirely disappear until after a month.

The other case was that of a young, thin, anæmic girl, whose knee had been excised and the wound dressed with the subnitrate. A fortnight after the operation, without elevation of temperature, the patient lost her appetite, was salivated, and presented all the symptoms of stomatitis. Bismuth was found in the urine. The course of this case was similar to that of the first.

The author quotes Rabuteau as saying that Dubinsky found "that bismuth, which is largely eliminated in the saliva, produces in the buccal mucous membranes effects which are similar to those of mercury." The author appears to be unaware of Steinfeld's recent investigation of the action of the salts of bismuth.

THE NEW MORTUARY IN BERLIN.

PROF. LIMAN (*Viertelj. f. gerichtl. Med.*, N. F., Bd. xlv. S. 170–178) gives a description, with plans, of the new mortuary which has just been completed in Berlin. It is a large horseshoe-shaped building, fifty-six metres long, and nineteen metres broad. It has been constructed with three objects in view: (1) To supply an ordinary police mortuary, for the laying out and identification of such dead bodies as come into the possession of the police; (2) to provide accommodation for the complete medical examination of the bodies in needful cases; and (3) for the teaching of medical jurisprudence. The central part of the building is devoted almost entirely to meeting the first of these objects. Besides cellars for holding identified bodies, there are seven small chambers for the exhibition of unidentified bodies, two in each. These chambers are lighted from above, and lie along a public corridor, from which they are separated, as well as from each other, by a glass partition. The temperature in these chambers and in the cellars is kept at 0° to 2° C. by means of copper pipes in which a solution of calcic chloride circulates, the solution being cooled by an ammonia ice machine in an adjacent cellar. On the same level as these chambers are two large rooms, one for washing the bodies and another for depositing the bodies after they are coffined. Conveniently near is a small chapel, where funeral obsequies may be performed in connection with bodies about to be removed for burial. A hydraulic elevator, capable of lifting three hundred kilos., is used for lifting bodies from one story of the building to another. The right wing of the building consists of two stories, one of which is devoted to the medico-legal examination of bodies, and the other to arrangements for teaching. In the former there is a commodious autopsy room, with two tables, two chemical laboratories, two private rooms for the physicians, a room for the crown officer, and a small waiting-room for the witnesses required to identify the bodies; in the latter, which is placed above the other, there is another autopsy room for purely teaching purposes, a lecture-room, a museum, a small library, and private rooms for the director of the institute and his assistant. The left wing of the building is mainly devoted to providing accommodation for servants. It also contains a telegraph office. The building, altogether, appears to be well planned, and might form a model for similar institutions in other towns.

HANGING IN HOT COUNTRIES.

PELLEREAU, of Mauritius, gives an interesting account of hanging in tropical climates (*Annal. d'hyg. Publ.*, sér. 3, tom. xvi. pp. 108–125, 1886). Accidental or homicidal hanging is rare, just as in colder countries. Hanging is nearly always suicidal, and is the mode of death most frequently resorted to by suicides. In Port Louis (population, 60,000) fifty cases of suicidal hanging occurred in six years (1878–1883). This mode of suicide is in favor, especially among the inferior classes of the population, the Creoles and Indians. The better classes, and the Chinese in Mauritius, have recourse more frequently to firearms or poison. Hanging is more common among the men than the women. The author has frequently been present at cases of judicial hanging, and has carefully observed the appearances at death and at the autopsy. The phenomena he divides into three successive groups or stages: first, a short period of immobility; second, a period of tetanic rigidity; and third, a period of clonic convulsions. Altogether they do not extend over more than two or three to five minutes. The onset of cadaveric rigidity is somewhat retarded. The post-mortem appearances are, in general, similar to those seen in other countries. In answering the question whether the hanging, in a doubtful case, has taken place during life, the author lays stress on swelling and lividity of the face; tongue between the teeth, enlarged and excoriated; excoriations on the superior and inferior extremities; evacuation of semen; staining of the scrotum and buttocks with urine and feces; mark of the cord; congestion of the brain and its envelopes; congestion of the larynx, trachea, bronchi, and lungs; congestion of the jejunum, ileum, and kidneys; dislocation of the atlas. These appearances may be all present in one case. Sometimes they are nearly all absent. In such a case the trickling out of the saliva from the mouth, and the presence of fragments of food in the larynx, trachea, bronchi, and œsophagus, as also the existence of petechiæ on the inferior extremities, and collapse of the lungs, may be looked for.

PUBLIC HEALTH.

UNDER THE CHARGE OF

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Recent Prevalence of Cholera in Europe.

Dr. Buchanan, F.R.S. the Medical Officer of the Local Government Board of England, has presented to his Board a report, giving (1) account of the prevalence of cholera in Europe in 1884 and 1885; (2) account of the International Conference which was held at Rome; (3) abstract reports on the condition of English ports and other districts in relation to their security against cholera; (4) some recent researches into the pathology of cholera. The first subject only can be referred to in this number.

An important part of the report on cholera prevalence is a statement by Dr. Thorne of the behavior of this disease in different European countries. Much care has been taken to make this as complete as possible, but at the time of its preparation the French Government had not issued their official report, except so far as relates to Paris.

(1884) In France the disease first appeared at Toulon, when, on June 23, 1884, it was announced that fourteen deaths had taken place. The disease was